Introduction to Riemann Surfaces

Course Information

Course responsible: Jonatan Lenells, jlenells@kth.se

Course homepage: Available in Canvas, kth.instructure.com/courses/8099

Literature: S. Donaldson, *Riemann Surfaces*, Oxford University Press, 2011.

Course description: The course will cover Parts I-II, as well as selected parts of Parts III-IV, of Donaldson's book *Riemann Surfaces*. The table of contents is as follows:

Part I Preliminaries
    1 Holomorphic functions
    2 Surface topology

Part II Basic theory
    3 Basic definitions
    4 Maps between Riemann surfaces
    5 Calculus on surfaces
    6 Elliptic functions and integrals
    7 Applications of the Euler characteristic

Part III Deeper theory
    8 Meromorphic functions and the Main Theorem for compact Riemann surfaces
    9 Proof of the Main Theorem
    10 The Uniformisation Theorem

Part IV Further developments
    11 Contrasts in Riemann surface theory
    12 Divisors, line bundles and Jacobians
    13 Moduli and deformations
    14 Mappings and moduli
    15 Ordinary differential equations

Prerequisites: A basic understanding of real and complex analysis and topology is expected.

Requirements/Grading: There will be homework assignments and, for students seeking a higher grade, an individual project. The individual project will involve writing a short paper on a topic of choice and an oral presentation. Grades will be assigned according to the following table:

Homework	Without project	With approved project
85-100%	C	A
60-84%	D	B
30-59%	E	C
0-29%	F	Fx